

17. The flight recorder and the reported altitudes coincided at 3,000 feet and "0" feet.
18. The actions of the captain and systems operator distracted the second pilot's attention from his primary job of flying the aircraft and monitoring its position in space.
19. The design of the landing gear indicator lights was not "fail-safe."
20. The recognized procedures for checks and balances between crewmembers were not followed during this approach.
21. There was no adequate altitude warning system required in air carrier aircraft.

(b) Probable Cause

The Board determines that the probable cause of this accident was the lack of crew coordination and the inadequate monitoring of the aircraft position in space during a critical phase of an instrument approach which resulted in an unplanned descent into the water. Contributing to this unplanned descent was an apparent unsafe landing gear condition induced by the design of the landing gear indicator lights, and the omission of the minimum crossing altitude at an approach fix depicted on the approach chart.

3. RECOMMENDATIONS

On January 12, 1970, the Board recommended that the FAA take corrective action to ensure detection by flightcrews of failed indicator bulbs in the DC-8 landing gear position indicators. On May 22, 1970, the FAA reported that they had investigated the suspected deficiencies and, in their opinion, the reassessment of the DC-8 landing gear indicator system showed that the system performed its function; had an adequate backup system; and was in conformance with all other pertinent Federal Aviation Regulations. It was their opinion that the landing gear indicator system provided the required reliability and aircraft operational safety. They did, however, recommend that all airlines which did not have a specific check of the indicator bulbs include such a check in their "Before Start" and "Before Landing" checklists. This latter action is one means frequently used to compensate for improvements that should have been made in the design of a safety feature.

The Board believes that earlier detection and adequate corrective action are needed in cases of this kind. The FAA action was pertinent to the Board's recommendation, but both FAA and the aviation industry should seek long-term corrective actions to eliminate problems of this nature.

The Board stresses the fact that it is the responsibility of the manufacturer and the operator to be alert to identify and correct problems of this nature before they become an accident causal factor. In this case, the aircraft manufacturer and the airline operator have been responsive to the problem. After the accident, McDonnell-Douglas designed alternate landing gear indicator covers that will provide positive indications to flightcrews when one light bulb is inoperative. SAS has installed covers on the landing gear indicators in their DC-8's that perform the same function.

The operational use of this improved design in all DC-8 aircraft would result in an enhancement of safety, complementing the action taken by the FAA.

Two other areas are worthy of consideration from the standpoint of accident prevention. These areas have not been the subject of formalized correspondence between the Safety Board and the FAA but are discussed in the paragraphs which follow.

There was one ancillary procedural service that was provided for the flight that was of questionable merit. This was the act of clearing the aircraft to the transition altitude of 18,000 feet and holding it there for 23 minutes. At the time the flight was cleared to 18,000 feet, it was given the then current altimeter setting of 29.86. The captain reset his altimeter; however, the second pilot, who was manipulating the controls, left his altimeter set at 29.92.

Although the lowest usable flight level varied with the barometric pressure, the existing Federal Aviation Regulations required that the transition from "flight levels" to thousands of feet should have occurred at 18,000 feet or higher. In this case, the actual altitude at which this change should have occurred was 18,500 feet.

The details of transition altitudes are considered pertinent to the controllers for the provision of appropriate altitude separation between those aircraft using 29.92 and those at lower altitudes using the local altimeter setting. It is also considered appropriate that the pilots utilize 18,000 feet as a fixed transition point. Likewise, it is recognized that there are times when the utilization of this altitude is required rather than face system delays at other points.

The Board recommends that when use of the transition altitude is required or opted, the controllers again give the current altimeter setting as the aircraft is cleared to descend below 18,000 feet. This procedure should obviate any possible chance of overlooking or forgetting to set the altimeters properly.

The C&GS approach chart for an LOC(BD)RWY 7R, dated 12 December 1968, for the Los Angeles International Airport carried the notation "ASR/PAR" in the plan view portion although PAR service was not available for this runway. The PAR listing is carried on all approach charts issued by the C&GS for an airport whenever that type of an approach is available for at least one runway. It is conceivable that this listing on a chart in this particular manner could be confusing and be interpreted to mean that the PAR served the runway whose approach procedure was depicted thereon.

The Board recommends that, if the PAR listing is to be carried on all approach charts for the facility where it is installed, the number of the runway(s) served by that PAR be added to the legend.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD:

/s/ JOHN H. REED  
Chairman

/s/ OSCAR M. LAUREL  
Member

/s/ FRANCIS H. McADAMS  
Member

/s/ LOUIS M. THAYER  
Member

/s/ ISABEL A. BURGESS  
Member

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